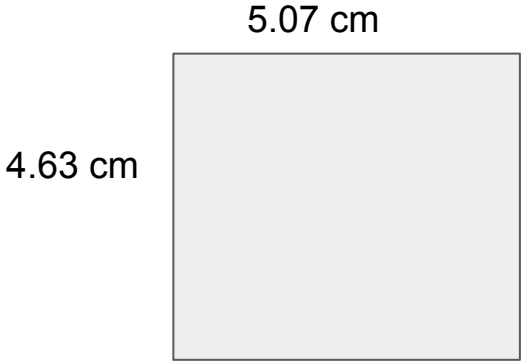
Density Measurements

Michael Higdon

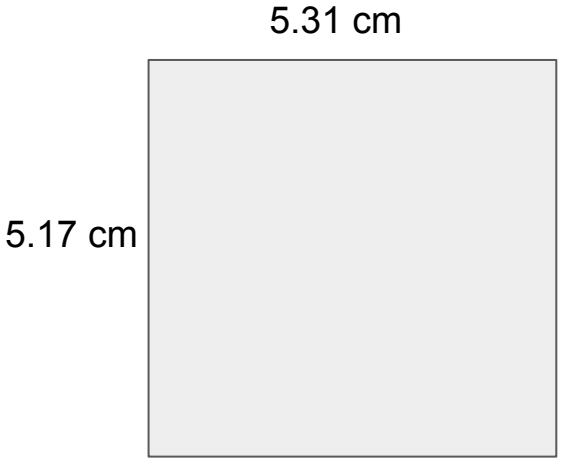
Filling 3’s Density

Total mass: 3,141 g

Length: 13.67 cm



Smaller End



Larger End

Average Height: 4.90
Average Width: 5.19

Volume: 347.64cm³
Density: 9.035 g/cm³

Density includes Tungsten, Fibers, Epoxy and Mesh

Tungsten Sample Density/Pack Density: Trial One

Sample	Mass Used (g)	Volume Before (cm^3)	**Density (g/cm^3)**	Volume After (cm^3)	**Δ**Volume (-cm^3)	% Change of Volume Before	**Density After (g/cm^3)**
Tungsten Heavy Powder (Most Recent Batch)	257.8	25.1	**10.27**	24.3	0.8	3.19%	**10.61**
“New Powder” (THP Second Most Recent Batch	277.0	24.6	**11.26**	24.5	0.1	0.41%	**11.31**
“Old Powder” (THP Oldest Batch)	277.1	28.7	**9.66**	28.0	0.7	2.44%	**9.90**
Buf-Tun	274.0	29.2	**9.38**	28.2	0.1	3.42%	**9.72**
Tungsten Metal Powder	272.2	37.1	**7.34**	34.0	3.1	8.36%	**8.01**
KennaMetal	208.8	34.2	**6.08**	29.3	4.9	14.33%	**7.10**

Density Measurements Trial 2 (No Packing)

Sample	Mass Used (g)	Volume (cm^3)	Density (g/cm^3)	Trial 1 Density (g/cm^3)	**Avg Density (g/cm^3)**
Tungsten Heavy Powder	200.0	19.5	10.26	10.27	**10.27**
“New Powder”	200.0	17.8	11.24	11.26	**11.25**
“Old Powder”	200.0	20.5	9.76	9.66	**9.71**
Buf-Tun	200.0	22.0	9.09	9.38	**9.24**
Tungsten Metal Powder	200.0	27.0	7.41	7.34	**7.38**
KennaMetal	200.0	30.4	6.58	6.08	**6.33**

Samples then had 200g Tungsten and 15g Epoxy (3 Brown, 12 White) added after density measurements

Tungsten Samples with Epoxy

Process:

- Measure 200g of each Tungsten sample
- Measure 15g of Epoxy (3g Brown, 12g White)
- Pour Tungsten into 4cm x 4cm x 4cm printed mold, then Epoxy
- Keep on vibrating pad until no air bubbles appear for 5 minutes

THP (Most Recent Batch) | THP (Second Most Recent batch) | THP (Old Batch) | Buf-Tun | TMP | KennaMetal

Tungsten Samples with Epoxy Cont'd.

THP (Most Recent Batch)

THP (Second Most Recent batch)

THP (Old Batch)

Although the same process was performed for each sample, the Oldest THP Tungsten was the only mold to have significant dry packets underneath.

Buf-Tun

TMP

KennaMetal